DOUBLE PLAY

INSTALLATION AND MAINTENANCE MANUAL

THE LELAND CORPORATATION

CINEMAT SYSTEM

1841 Friendship Drive

El Cajon, CA   92020-9981

Telex: CINTRON 4974293

FAX: 619-562-9468

FCC WARNING

This equipment generates, uses, and can radiate radio frequency
energy and if not installed and used in accordance with the
instruction manual, may cause interference to radio
communications.

It has been tested and found to comply with the limits for class
A computing devices pursuant to subpart J of part 15 of FCC
Rules, which are designed to provide reasonable protection
against such interference when operated in a commercial
environment.

Operation of this equipment in a residential area is likely to
cause interference in which case the user at his own expense
will be required to take whatever measures may be required
to correct the interference.

POWER REQUIREMENT WARNING !

A power supply capable of supplying the following current (or
greater) must be used for game conversion:

7 amps @ + 5.0 VDC
1 amp   @ - 5.0 VDC
1 amp   @ + 12.0 VDC

RECORD OF SERIAL NUMBERS

Record the game serial numbers and date purchased for future
reference and/or game service.

Date purchased:_____

Main Circuit Board S/N:_____

Input/Output and Memory Expansion circuit board S/N:_____

Program part number (on EPROMs) :_____

Software serial number (on "attract mode" screen):_____

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LIST OF ILLUSTRATIONS

A. WARRANTY

Seller warrants that its printed circuit boards, monitor and power supply, when furnished with the product and parts thereof are free from defects in material and workmanship under normal use and service for a period of ninety (90) days from date of shipment. Seller's warranty of above parts is subject to the normal use and service of its product. None of the seller's other products or parts thereof are warranted.

If the products described in this manual fail to conform to this warranty, seller's sole liability shall be, as mutually agreed, to replace or repair such products which are returned to seller during said warranty period provided.

CONDITIONS:

      a.   Seller must be promptly notified in writing upon discovery by buyer that said products are defective.

      b.   Products must be returned prepaid to seller plant.

      c.   Seller's examination of said products discloses to seller's satisfaction that such alleged defects existed and were not caused by accident, misuse, neglect, alteration, improper repair, installation or improper testing.

Seller is not responsible for bent pins on ICs not installed by seller's employees. In no event shall seller be liable for loss of profits, loss of use, incidental or consequential damages.

Except for this express warranty, seller disclaims all other warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose, and all other obligations or liabilities on seller's behalf, and it neither assumes nor authorizes any other person to assume for seller any other liabilities in connection with the sale of products manufactured by seller.

NOTICE REGARDING THE USE OF NON-SELLER REPLACEMENT PARTS:

Seller recommends the use of only seller's parts when replacing any malfunctioning component or assembly in the seller's system. For safety and reliability, seller does not recommend or authorize any substitute parts or modifications of seller's equipment. Such alterations may adversely affect game play, cause serious injury, and void your warranty. Unauthorized parts, modifications and non-seller's game conversion kits may also void FCC compliance.

To obtain repair, contact seller at 619-562-7000 between 8 AM and 5 PM Pacific Standard Time to obtain an RMA return authorization number. Affix this number to the outside of the shipping container when returning goods. Return to the above address.

B.   HINTS FOR SUCCESSFUL GAME INSTALLATION

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Take some advice from the game masters. Successful
game installation can be simple if you take a minute
and read the following hints. It is worth it's weight
in aspirin!

1. INSPECT YOUR KIT

    Inspect all received parts for shipping damage and
    to familiarize yourself with the parts. Inspect
    all integrated circuits (hereafter called "IC")
    for bent pins (being careful not to bend
    the pins).

2. THE OLD CASE OF THE BENT IC PIN

    The #1 killer of a successful game installation, or for
    that matter, any other electronic device's proper
    operation, is bent pins. Avoid this plague and take
    the time (and patience) to make sure that all pins are
    in each hole and not bent.

    Also, installing ICs with bent pins runs the risk of
    bending the pins even further and eventually breaking
    them.

    If pins are bent, first, grip the group of pins
    lengthwise with long needle-nose pliers. This
    gripping action will straighten them in this direction.
    Next, if any pins are bent in the other direction,
    straighten each one individually with needle nose
    pliers being careful not to over-compensate. This
    overcompensation may break the pin.

3. ATTACH THE GROUND

    Make sure to attach the ground braid to the
    control panel. Players risk an electric shock
    if the control panel is not properly grounded.

    Refer to figure 5 for ground braid connection.

4. WHICH POLE IS WHICH (OBSERVING POLARITY)?

    Electronic circuits are quite sensitive to polarity and
    can easily lose their sense of humor when the polarity
    is reversed. A fuse may not be all they blow!
    Experienced electronic engineers check the polarity
    two times before applying power! You should probably
    check it three times.

    Refer to figure 1 on the next page for proper 115 VAC
    and DC power connections.

AC/DC POWER CONNECTION

FIG. 1

5. MARQUEE BLUES (MARQUEE INSTALLATION)

Your game is a money making investment! Why compromise
by installing a crooked marquee? Avoid this and follow
these instructions for installing:

First, place the plexiglass on a table. Next, center
the decal on the plexiglass, getting an idea of the
general location (before peeling off the back). Now,
carefully peel off the back and place the far edge
(lengthwise) on the plexiglass first, centering
the remaining un-stuck (important) decal. Finally,
"roll" down the rest of the decal, slowly, squeezing
the air bubbles out with your hand.

Pictured is the marquee on a Cinemat System Cabinet.
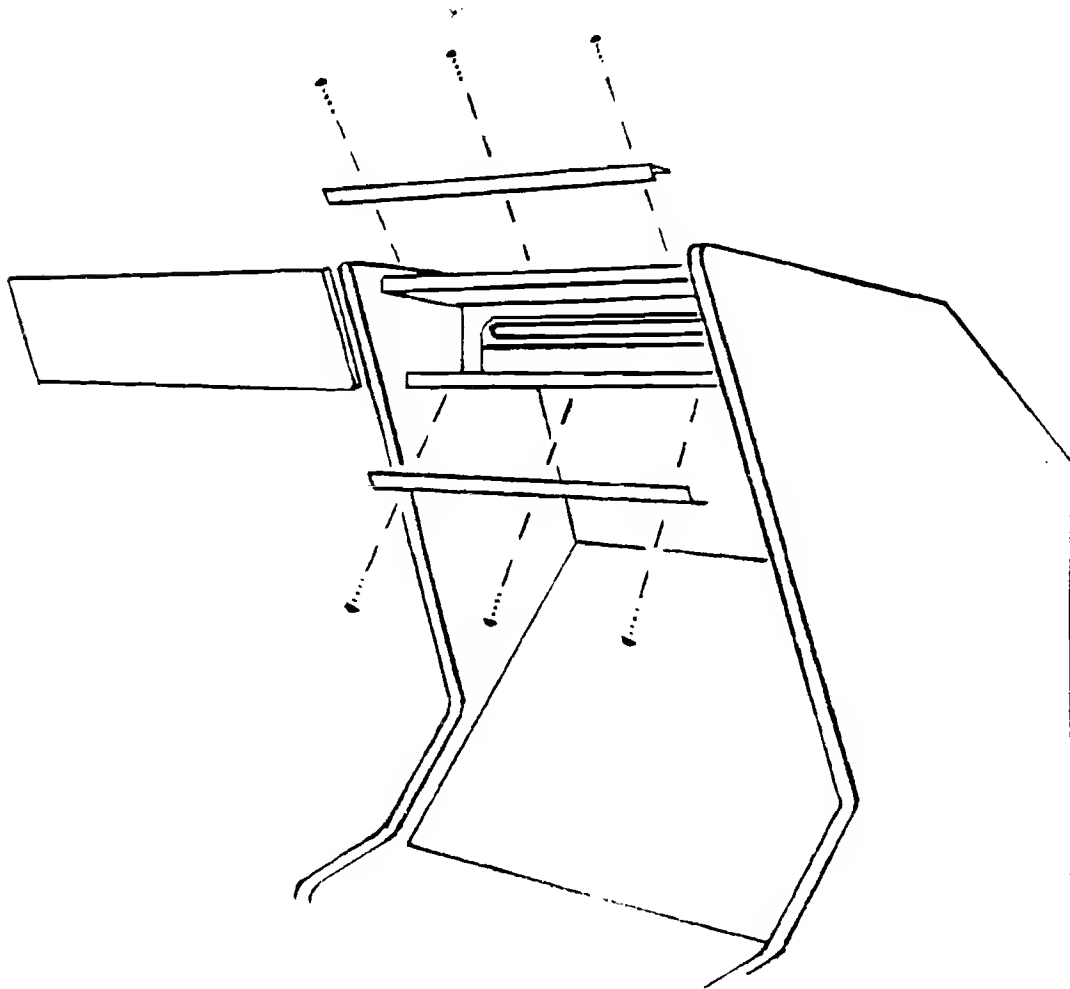
MARQUEE INSTALLATION

FIG. 2

6. RUN DIAGNOSTICS (OR GAME INSTALLATION SUCCESS
    OR FAILURE)

    Five minutes of diagnostics may save an hour of
    frustration wondering why a feature does not work. Our
    software department is the best in the business. They
    labored long and hard to write diagnostics to
    thoroughly check out your game. Take the time to
    follow the diagnostics section and prove to yourself
    that the entire game is working properly.

    Next, play the game a couple of times to verify that
    all is well.

7. MONITOR OUTPUTS

    The outputs from our system to the monitor are red,
    green and blue with negative horizontal and negative
    vertical sync.

8. HOW DO I TURN UP THE SOUND ?

    Volume adjustment is easy. Refer to figure 3 and
    locate VR1 (on main circuit board). Now look at the
    main board (largest board). Clockwise rotation
    increases the volume.

C. GAME MODULE INSTALLATION

C. GAME MODULE INSTALLATION

1. Parts for the DOUBLE PLAY game module are
   as follows. Please inspect and check off:

   QTY   DESCRIPTION

   1   Manual, DOUBLE PLAY
   1   DOUBLE PLAY Marquee Lexan Decal
   1   Plexiglass Marquee
   1   Cinemat I/O Expansion Board
   26   EPROMs (Game Software)
   1   Custom Chip (U120)
   1   02-14 Custom Chip
   1   Control Panel Assembly
   4   1 1/2" Carriage Bolts
   4   #10 Flat Washers
   2   #10-24 Hex Nuts
   2   #10-24 Wingnuts
   5   5/16"x 1" Spacers
   5   6/32"x 1-1/2" Bolts
   1   40 Pin Ribbon Interconnect Harness
   1   10 Pin Power Interconnect Harness

2. Install the 26 DOUBLE PLAY EPROMS in the main board
   noting the chip location ("U" number) printed on
   each chip and referring to Figure 3. Match the
   location of pin 1 of both the EPROM and socket,
   plug each EPROM into the socket indicated. Be sure
   all EPROMs' pins are aligned and the EPROMs are
   pressed firmly in place.

3. Install the custom chip U120 in the main logic
   board at location U120 and the 02-14 custom
   chip at U85 making sure Pin 1 of the chip and Pin
   1 of the socket are aligned.

4. Recheck steps 2 and 3 for proper parts placement
   and orientation.

5. Remove the Z-80B microprocessor from location U99
   of the main logic board and reinstall it at
   location U13 of the I/O and Memory Expansion
   board. Install the I/O and Memory Expansion board
   ribbon cables as shown in figure 6.

6. Position the DOUBLE PLAY control panel assembly on
   the cabinet and attach using the 1 1/2"
   carriage bolts, washers and 10-24 hex nuts
   provided. Install only the front-most bolt, washer,
   and nut on each side at this time. See figure 5.

7. Route the control panel wiring harness. Locate the three connectors labeled P5, J4 and J5 at the end of the control panel harness. Plug connectors P5 into connector P5 located along the top edge of the main logic board. Similarly, plug J4 into J4 and J5 into J5 of the I/O and Memory Expansion board. Plug the remaining two wires (white and violet) of the control panel harness into connector P4 of the main board. Refer to Connector Pinout Chart in back of manual.

8. Attach the marquee to the plexiglass using the procedure in section B above.

9. Installation of the game module is now complete. We suggest you now use the system's "on board" diagnostics to inspect the game. See the diagnostics section of this manual.

10. After testing the control panel, use the remaining two carriage bolts, washers and wing nuts to secure the control panel.

TO MONITOR

TO SPEAKER

P1

P2

P3
POWER
IN

RESET
SW1

P4

141
U120

P5
TO
CONTROL
PANEL

P6
NOT
USED

P4: COIN SW
SERV SW
1 AND 2
PLAYER
START

VR1 VOLUME
CONTROL

DOUBLE PLAY
CINEMAT MAIN LOGIC
PRINTED CIRCUIT ASSEMBLY
COMPONENT SIDE

TYPICAL
PIN 1
LOCATION

U9 DOUBLE PLAY 03-15006-VSN
U8 DOUBLE PLAY 03-15005-VSN
U7 DOUBLE PLAY 03-15004-VSN
U6 DOUBLE PLAY 03-15002-VSN
U5 DOUBLE PLAY 03-15002-VSN
U4 DOUBLE PLAY 03-15001-VSN
U3 DOUBLE PLAY 03-15000-VSN

U21 05-01
U19 06-01
U17 04-01
U16 03-01

U27 11-01
U26 10-01

U43 07-01
U42 08-01
U40 09-01

U85 02-14

U96 01-01

U107 DOUBLE PLAY 03-15024-VSN
U106 DOUBLE PLAY 03-15023-VSN
U105 DOUBLE PLAY 03-15022-VSN
U104 DOUBLE PLAY 03-15021-VSN
U103 DOUBLE PLAY 03-15020-VSN
U102 DOUBLE PLAY 03-15019-VSN
U101 DOUBLE PLAY 03-15018-VSN

U95 DOUBLE PLAY 03-15017-VSN
U94 DOUBLE PLAY 03-15016-VSN
U93 DOUBLE PLAY 03-15015-VSN

U92 DOUBLE PLAY 03-15014-VSN
U91 DOUBLE PLAY 03-15013-VSN
U90 DOUBLE PLAY 03-15012-VSN
U89 DOUBLE PLAY 03-15011-VSN

U70 DOUBLE PLAY 03-15010-VSN
U69 DOUBLE PLAY 03-15009-VSN
U68 DOUBLE PLAY 03-15008-VSN
U67 DOUBLE PLAY 03-15007-VSN

JP1

JP2

JP3

FIG. 3   MAIN CIRCUIT BOARD ASSEMBLY

DOUBLE PLAY
MEMORY AND I/O EXPANSION
PRINTED CIRCUIT ASSEMBLY
COMPONENT SIDE
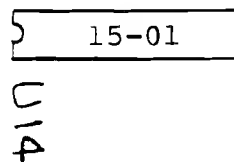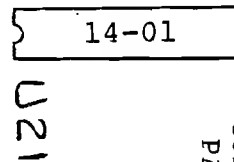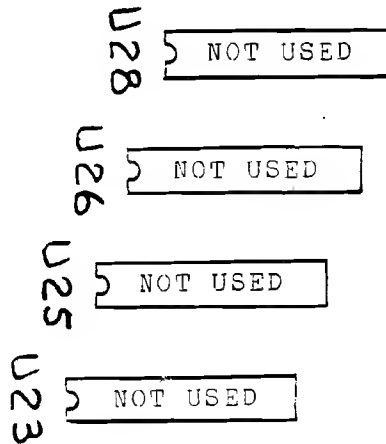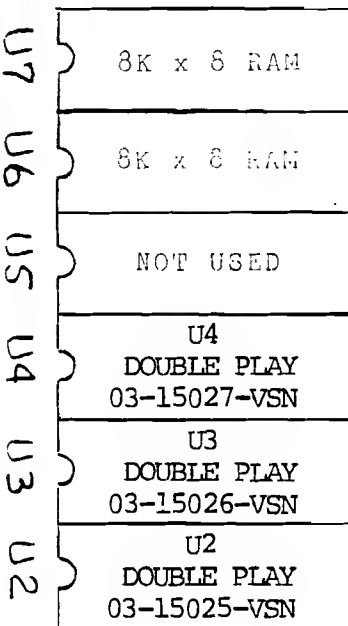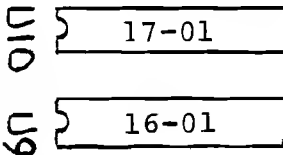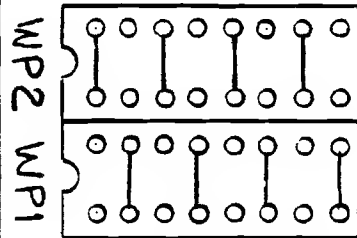
POWER FROM POWER SUPPLY — J1

POWER TO MAIN LOGIC — J2

W5

U28 NOT USED
U26 NOT USED
U25 NOT USED
U23 NOT USED

J3 NOT USED

U21 14-01

J4 TO CONTROL PANEL

WP2 WP1
U10 17-01
U9 16-01

U7 8K x 8 RAM
U6 8K x 8 RAM
U5 NOT USED
U4 DOUBLE PLAY 03-15027-VSN
U3 DOUBLE PLAY 03-15026-VSN
U2 DOUBLE PLAY 03-15025-VSN

U14 15-01

J5 TO T.A.G. BOARD

J6 NOT USED

TYPICAL PIN 1 LOCATION

J7A TO U99 MAIN LOGIC

INPUT/OUTPUT AND
MEMORY EXPANSION
CIRCUIT BOARD ASSEMBLY
FIG. 4
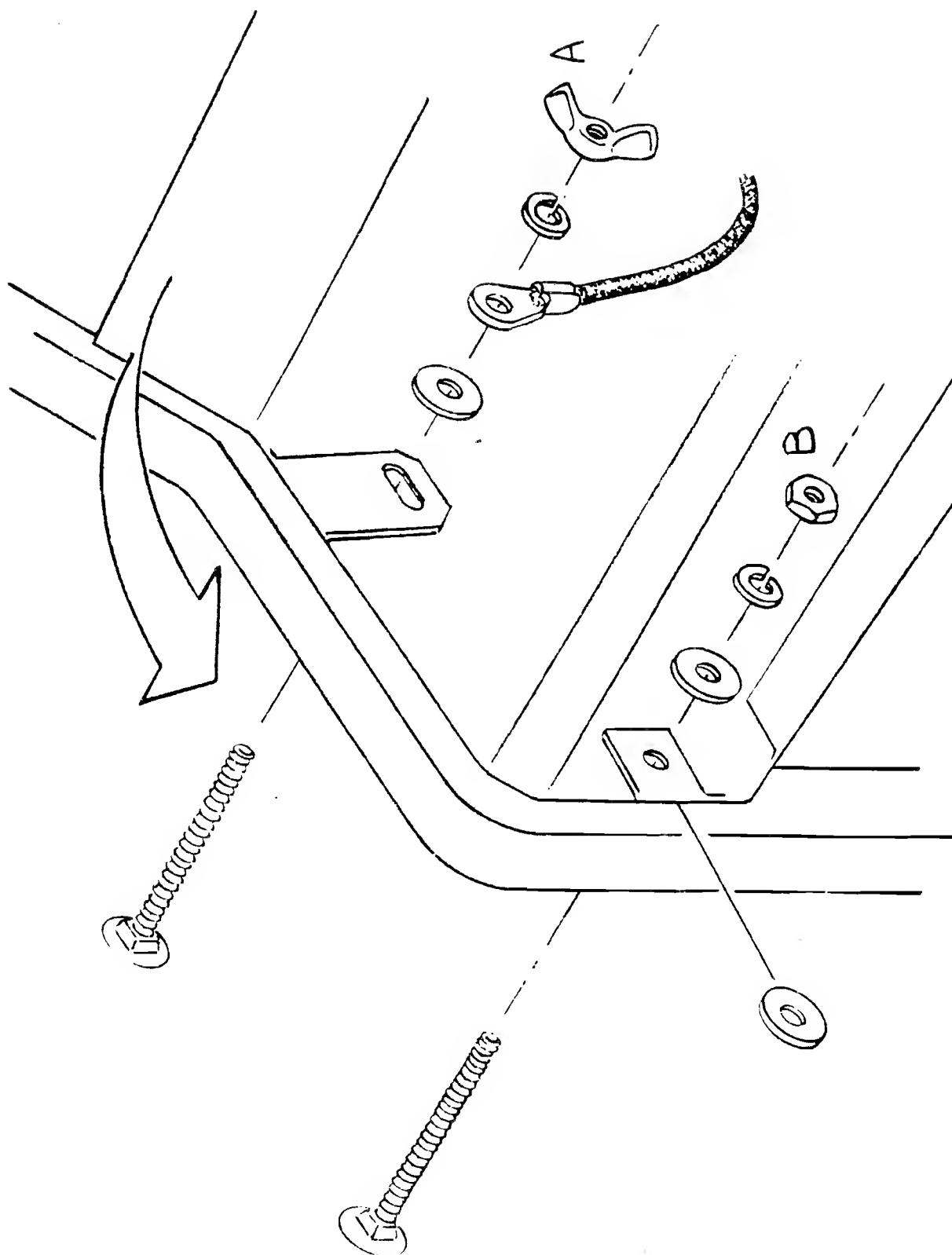
CONTROL PANEL BOLT AND GROUND BRAID

FIG. 5
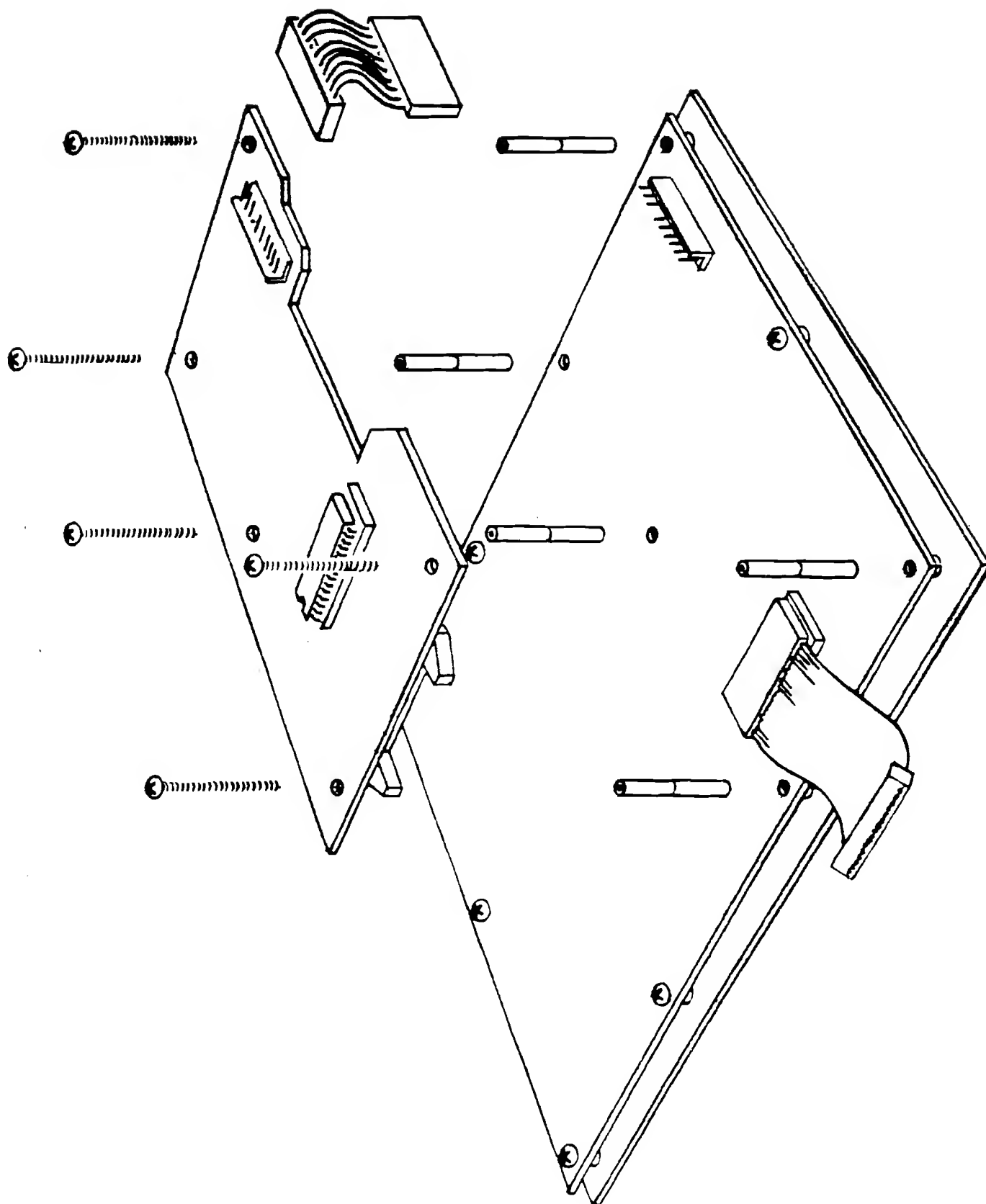
PIGGYBACK CIRCUIT BOARD MATING

FIG. 6

D. UNIVERSAL GAME CONVERSION

D. UNIVERSAL GAME CONVERSION

1. Parts for the DOUBLE PLAY conversion kit
   are as follows. Please inspect and check off:

   QTY   DESCRIPTION

   1   Plexi, Marquee
   1   Decal, Marquee
   10   Ty-Wrap w/eyelet
   1   Control Panel Assembly, DOUBLE PLAY
   1   Circuit Board Assembly, DOUBLE PLAY
   1   Manual, DOUBLE PLAY
   1   Harness, Video
   1   Harness, Coin Service
   1   Harness, Speaker
   2   Decals, Cinemat
   1   DC Power Harness

2. Remove existing game control panel, and all buttons
   or joystick controls associated with it. Position
   the universal control panel above the control
   panel intended for conversion. Feed the harness
   through a convenient hole large enough for the harness
   connectors. Refer to Figure 7.

3. Securely mount the universal control panel with a
   bolt or screw not easily removed from the exterior
   of the cabinet. Avoid pinching the wires. Secure using
   the ty-wraps included with your kit.

3. When routing the harness, leave enough slack so that
   servicing of the control panel and circuit board
   assembly can be accomplished with relative ease. Place
   a wire ty-wrap as close to the circuit board connectors
   as possible to relieve strain on the connector pins.

4. Mount the circuit board in an area of the cabinet that
   receives ample ventilation. Make sure the circuit
   board can be removed easily for service.

5. Refer to the D.C. power wiring diagram, making all
   the power connections as shown. Be sure to hook
   up the ground braid. Also, observe proper
   polarity. Careful with this one!

6. The last order of business is the Marquee and
   Plexiglass. See section B above for this procedure.

7. The conversion process is now complete. It is
   recommended at this point, to go into diagnostics
   to test the performance of the new kit.
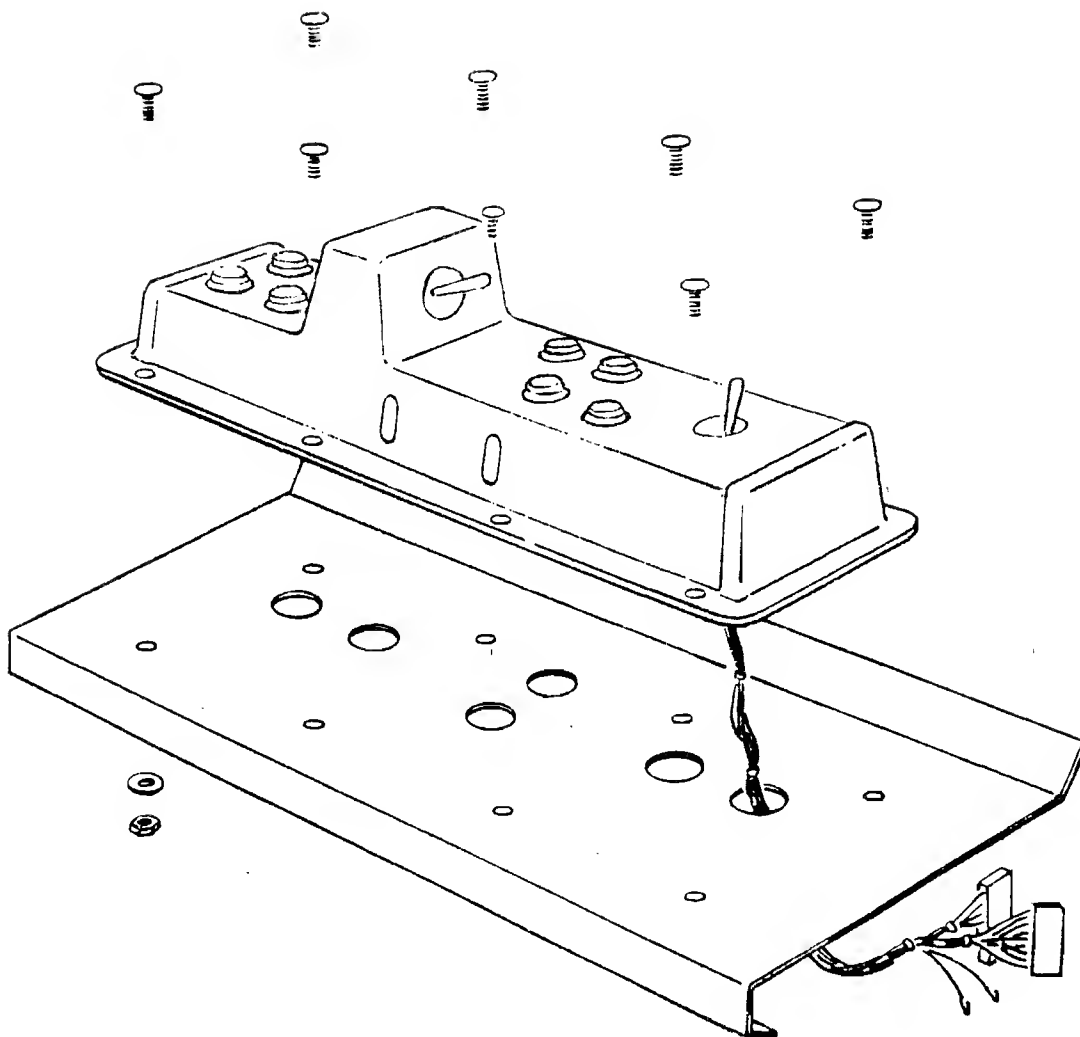
CONTROL PANEL MOUNTING AND CABLE ROUTING

FIG. 7

E. BOOKKEEPING / DIAGNOSTIC FUNCTIONS

E. BOOKKEEPING / DIAGNOSTIC FUNCTIONS

DOUBLE PLAY has extensive bookkeeping and
diagnostic functions. These functions are explained in the
following sections:

1. INVOKING DIAGNOSTICS

With the game running in the attract mode follow these steps:

a. Press and hold the one-player start button while
    pressing and releasing the service button (found
    inside the coin door mounted to the top of the
    coin box). Concerning Kits, connect the
    appropriate pins to ground referring to the
    Connector Pinout Chart in the back of the manual.

b. Release the one-player start button.

c. The game screen should now appear as shown on
    the next page. Instructions for selecting and
    entering the listed functions are displayed at
    the top of the screen with the five selectable
    options below them. The game's software version
    number is shown in the lower left-hand corner of
    the screen.

2. SELECTING THE DESIRED FUNCTION

The one-player start button selects the desired
function. The function has been selected when the
display color for that particular function changes.
Pressing the two player start button enters the
selected function. Selecting the RESTART THE GAME
function returns the game to normal operation.

An example of the display is as follows:

MAIN MENU

SELECT FUNCTION WITH ONE PLAYER START BUTTON
ENTER FUNCTION WITH TWO PLAYER START BUTTON

BOOKKEEPING
DIAGNOSTICS
GAME SET-UP
GAME STATISTICS
INNING DURATION GRAPHS
ERASE ALL PLAYER STATISTICS

RESTART THE GAME

S/N: xxxxxxxx

3.   BOOKKEEPING

The bookkeeping screen is displayed when that option is
selected and entered from the main menu.
Five lifetime counters are shown. These counters are
set to zero at the factory and are not resetable by the
operator. These counters are:

COINS DROPPED MECH 1 - This counter shows the total
number of coins that have dropped through the LEFT coin
mech.

COINS DROPPED MECH 2 - This counter shows the total
number of coins that have dropped through the RIGHT coin
mech.

TOTAL COINS DROPPED - This is the total number of coins
dropped through BOTH mechs.

SERVICE BUTTON PRESSED - The number of times that the
service button has been pressed. Pressing the
service button to enter the bookkeeping / diagnostic
section does not affect this counter.

TOTAL CREDITS GIVEN - The total number of credits the
game has given in it's lifetime is shown on this
counter. (See the game setup section of this
manual for information on setting the number of coins
per credit).

a.   PERIOD AND DOLLAR COUNTERS

Three resetable counters, located to the right of
the lifetime counters are provided to aid the
operator in tracking the games' cash intake over a
period of time. These counters are:

1.   coins dropped
2.   dollars collected

As in the main menu, these options are selected by
pressing the one-player start button and entered by
pressing the player two start button. To reset the
period and dollar counters for either coin mech, press
the one-player start button until the message "RESET
COIN MECH 1 (or 2) DOLLARS COLLECTED" changes color.
Then press the two-player start button.

b.   SETTING COINS/TOKENS PER DOLLAR

To calculate dollars collected, the bookkeeping
system needs to know how many coins/tokens are
required to make a dollar. Normally, this number

would be 4 for quarter operation. If you operate
a location where, for example, 6 tokens equal one
dollar, then the dollar multiplier should be
changed to 6 so that the dollars collected
counters will reflect accurately what the game has
earned.

To change the coin "multiplier," use the one-player
start button to highlight the COINS PER DOLLAR
message for the desired coin mech then use the
two-player start button to change the
multiplier.

c.   EXAMPLE OF SETTING TOKENS PER DOLLAR

An arcade giving 10 tokens per dollar should have
the coins/tokens per dollar multipliers set as
shown.

An example of the display is as follows:

         10 COINS PER DOLLAR COIN MECH 1
         10 COINS PER DOLLAR COIN MECH 2

NOTE: THE COINS PER DOLLAR MULTIPLIER DOES NOT
AFFECT THE NUMBER OF COINS PER CREDIT OR CREDITS
PER COIN. SEE THE GAME SET-UP SECTION OF
THIS MANUAL FOR THAT INFORMATION.

                    BOOKKEEPING

       SELECT FUNCTION WITH ONE PLAYER START BUTTON
       ENTER FUNCTION WITH TWO PLAYER START BUTTON

	LIFETIME COINS	PERIOD COINS	DOLLARS
COINS DROPPED - MECH 1	0	0	$0.00
MECH 2	0	0	$0.00
TOTAL COINS DROPPED	0	0	$0.00
SERVICE BUTTON PRESSED	0		
TOTAL CREDITS GIVEN	0		

         RESET COIN MECH 1 DOLLARS COLLECTED
         RESET COIN MECH 2 DOLLARS COLLECTED

         SET COINS/TOKENS PER DOLLAR:
         4 COINS PER DOLLAR COIN MECH 1
         4 COINS PER DOLLAR COIN MECH 2

              RETURN TO MAIN MENU

4. DIAGNOSTICS

    The diagnostic menu is displayed upon entering
    diagnostics from the main menu. The player can then
    select the desired function.

    An example of the display is as follows:

                          DIAGNOSTICS

          SELECT FUNCTION WITH ONE PLAYER START BUTTON
          ENTER FUNCTION WITH TWO PLAYER START BUTTON

                    BUTTONS AND CONTROLS TEST
                    PROCESSOR MEMORY TEST
                    VIDEO ALIGNMENT SCREENS
                    VIDEO MEMORY TEST
                    VIEW BACKGROUND SCREENS

                    RETURN TO MAIN MENU

    a.   BUTTONS AND CONTROLS TEST

         This test allows the operator to check the game
         controls and switches. Pressing a button or
         activating a control causes the description of
         that button or control to change color on the
         video screen.

         The word GOOD will appear to the right of the
         control's description when the switch contacts
         close and will remain on the screen until the
         button is released.

         Pressing the two-player start or service button
         twice will end the test and return you to the
         diagnostic menu.

         An example of the display is as follows:

              PRESS THE FOLLOWING BUTTONS:

              1 PLAYER START
              2 PLAYER START
              MECH 1 COIN BUTTON
              MECH 2 COIN BUTTON
              SERVICE SWITCH

              GO BACK BUTTON
              EXTRA BASE BUTTON
              LEFT RUN/STEAL BUTTON
              RIGHT RUN/STEAL BUTTON
              RUN/CUTOFF BUTTON

RUN/AIM BUTTON

BATTERS JOYSTICK HORIZONTAL: xxH
xxxxxxxx bar graph xxxxxxxxxxxxxxxxxxxxxxxx

BATTERS JOYSTICK VERTICAL: xxH
xxxxxxxx bar graph xxxxxxxxxxxxxxxxxxxxxxxx

PITCHING JOYSTICK HORIZONTAL: xxH
xxxxxxxx bar graph xxxxxxxxxxxxxxxxxxxxxxxx

PITCHING JOYSTICK VERTICAL: xxH
xxxxxxxx bar graph xxxxxxxxxxxxxxxxxxxxxxxx

PRESS THE PLAYER 2 OR SERVICE SWITCH BUTTON TWICE TO EXIT

b.   PROCESSOR MEMORY TEST

The processor memory test checks all on-board RAM
and EPROM memory with the exception of the video
memory. The messages TESTING MASTER ROM, TESTING
MASTER RAM, TESTING COLOR RAM and TESTING SLAVE
MEMORY will each appear on the left side of the
screen as each of those tests are performed. The
result of each test (pass or fail) is displayed on
right side of the screen next to the description
of that test.

Two error messages may appear during slave memory
test, these are COMMUNICATION ERROR and SLAVE NOT
RESPONDING. ICs to be checked, in order of
priority, are listed below:

COMMUNICATIN ERROR - a. U19
                     b. U21 through U23
                     c. U45
                     d. U60
                     e. U62
                     f. U64

SLAVE NOT RESPONDING - a. U10 (slave RAM)
                       b. U3 (EPROM)
                       c. U1 (Z80 CPU)
                       d. U2
                       e. U20, U18
                       f. U61, U63

In the case of a failure of a ROM or RAM, the
location (U number) of the suspected part is shown
on the screen.

The following is an example of the display
indicating a U107 failure.

PAGE 27

PROCESSOR MEMORY TEST

TESTING MASTER ROM	MASTER ROM	BAD
	CHIP 107	SUSPECT
TESTING MASTER RAM	MASTER RAM	GOOD
TESTING COLOR RAM	COLOR RAM	GOOD
TESTING SLAVE MEMORY	SLAVE ROM	
	SLAVE RAM	

PRESS 2-PLAYER START TO EXIT TESTING

c.   VIDEO ALIGNMENT DISPLAY

Three video alignment screens are provided to aid
in adjusting the game's video monitor for
maximum picture quality. Refer to the video
monitor technical manual (not supplied) for
technical information and adjustment instructions.

The first screen consists of a white crosshatch
pattern. This should be used to adjust screen
position, horizontal size, vertical size and
focus. Pressing the two-player start button
advances the display to the next alignment screen.

The second alignment screen is used to adjust the
red and green intensity. An eight level
(0-7) color scale is shown for each red and green.
The monitor should be adjusted so that
level zero is black and one through seven
appear as seven distinct levels.

The third alignment screen shows a four level blue
color scale. Adjust the blue intensity so that
level zero is black and levels one through three
show as three distinct shades of blue. Eight
other colors are also displayed for reference,
they are, from 0 through 7 respectively: blue,
green, red, cyan, magenta, yellow, gray and white.

d.   VIDEO MEMORY TEST

The video memory test checks the foreground video
memory. The test appears as a series of colored
bars moving across the screen. After each pass
(about 5 seconds), the results of the test will be
displayed on the screen.

If the test was successful (all RAMs good), the message "VIDEO RAM CHECKS OK" will be displayed for about 1 second and the test will be repeated. Pressing the two-player start button anytime during the test will abort the test and return you to the diagnostic menu.

If the memory test fails, the message "VIDEO RAM TEST FAILED" will be displayed along with the location (U number) of the suspect RAM. In the event that the video error display is unreadable, a series of tones will also indicate the suspect chip (see table below).

NUMBER OF AUDIBLE BEEPS	SUSPECT ICs
2	U35 and U36
4	U33 and U34
6	U48 and U49
8	U46 and U47

e.   VIEWING BACKGROUND SCREENS AND BACKGROUND TEST

This test is set up to view all the background screens by pressing the one-player start button to advance the screens. Pressing the two-player start button exits the program.

An example of the display is as follows:

BACKGROUND PROM TEST

PRESS 1-PLAYER START TO ADVANCE.
OR PRESS 2-PLAYER START TO EXIT.

10.   GAME SET-UP

The game option set-up section allows the operator to change various game options. As explained in previous sections, the one-player start button selects and highlights the desired function and the two-player start button enters or executes the function.

a.   COINS PER CREDIT / CREDITS PER COIN

The coinage of each mech may be set to require multiple coins for each credit or give multiple credits for each coin.

To change coinage, follow the example screens below: (all examples assume 1 coin=25 cents)

```
For 25 cent play:        1 COIN FOR
                         1 CREDIT

For 50 cent play:        2 COINS FOR
                         1 CREDIT

Two plays for 25 cents:  1 COIN FOR
                         2 CREDITS
```

b.   EXTRA PLAY

An option is included to award an extra play for
the insertion of multiple coins before the game is
started.

For example, if the coinage is set as follows:

```
          1 COIN FOR
          1 CREDIT
          EXTRA PLAY FOR 2 CREDITS
```

then the result will be, 1 coin will give 1 credit
and 2 coins will give 3 credits. Each additional
coin will add one credit.

c.   ATTRACT MODE SOUND

This option, when selected, enables the game
sounds during the attract mode.

An example of the display is as follows:

                    GAME SET-UP

SELECT FUNCTION WITH ONE PLAYER START BUTTON
ENTER FUNCTION WITH TWO PLAYER START BUTTON

COIN MECH 1
          1 COIN FOR
          1 CREDIT
          NO EXTRA PLAY

COIN MECH 2
          1 COIN FOR
          1 CREDIT
          NO EXTRA PLAY

TWO PLAYER INNING FOR 1 CREDIT _ _ _ _ NO
ATTRACT MODE SOUND _ _ _ _ _ _ _ _ _ YES

          RETURN TO MAIN MENU
```

11. GAME STATISTICS

   Game statistics are provided to aid the operator
   in setting up his game for maximum profit.

   The operator may reset the game statistic counters by
   selecting the "reset game statistics" function.

   An example of the display is as follows:


                    GAME STATISTICS

         SELECT FUNCTION WITH 1-PLAYER START BUTTON
         ENTER FUNCTION WITH 2-PLAYER START BUTTON

              NUMBER OF 1-PLAYER INNINGS:   0
                            PLAYER WINS:    0
                         COMPUTER WINS:  0


              NUMBER OF 2-PLAYER INNINGS:   0
              COMPLETE GAMES BOUGHT:        0

              RESET GAME STATISTICS

              RETURN TO MAIN MENU


12. INNING DURATION GRAPHS

   Graphs are provided which indicate the duration of one
   and two player innings.  Average play time is also
   displayed.  These graphs may be reset by selecting the
   reset options located at the bottom of the screen.

   An example of the display is as follows:


                 INNING DURATION GRAPHS

        SELECT FUNCTION WITH ONE PLAYER START BUTTON
        ENTER FUNCTION WITH TWO PLAYER START BUTTON

ONE PLAYER INNINGS:                        AVERAGE TIME: 0:00

       0:00-1:00                    0  xxxx bar graphs follow xxx
       1:00-1:30                    0
       1:31-3:00                    0
       3:01-5:00                    0
       5:01-10:00                   0
      10:01-15:00                   0
      15:01-20:00                   0
      20:01-25:00                   0
      25:01-30:00                   0
      30:01-UP                      0


                          PAGE 31

```
TWO PLAYER INNINGS:                        AVERAGE TIME: 0:00

     0:00-1:00                  0   xxxx bar graphs follow xxx
     1:01-3:00                  0
     3:01-5:00                  0
    5:01-10:00                  0
   10:01-15:00                  0
   15:01-20:00                  0
   20:01-25:00                  0
   25:01-30:00                  0
   30:01-UP                     0

       RESET 1-PLAYER INNINGS AND BAR GRAPHS
       RESET 2-PLAYER INNINGS AND BAR GRAPHS
       RETURN TO MAIN MENU
```

13. ERASE ALL PLAYER STATISTICS

   DOUBLE PLAY will store player statistics
   for 300 players in battery backed-up memory. To clear
   these statistics select the ERASE ALL PLAYER STATISTICS
   option from the menu shown below. Similarly the top
   player lists may be erased by selecting that option.

   An example of the display is as follows:

                  ERASE ALL PLAYER STATISTICS

        SELECT FUNCTION WITH ONE PLAYER START BUTTON
        ENTER FUNCTION WITH TWO PLAYER START BUTTON

        ERASE ALL STATS ON EXIT?   NO
        ERASE TOP PLAYER LISTS ON EXIT?   NO

                     RETURN TO MAIN MENU

D. SYSTEM TROUBLESHOOTING GUIDE

   The entire Cinemat game system can be broken down into major
   groups. A brief guide to troubleshooting each section
   follows:

   1. Input/Output functions:

      a. Monitor

         1. No raster (i.e. black screen)

            a. Check AC supply to monitor. If there is
               no power at the monitor, trace the

wiring back to the isolation transformer and/or verify that power is reaching the transformer.

    b.   Check monitor fuses.

2.   Display scrolls (apparent syncronization problem).

    a.   Check monitor alignment adjustments.

    b.   Check RGB and syncronization signals on PCB connector and trace through to the monitor.

3.   Black screen

    a.   Check for +5.0 VDC at circuit boards.

    b.   Check connectors are securely seated and in the proper position.

4.   White or checkerboard screen.

    a.   Check for +5.0 VDC on P4 - 3 through 7. If any of these signals are low, replace U114 (74LS08). If this fails, replace U119 (74LS257).

    b.   Check the clock signal on the master Z80 (U99-6), DOUBLE PLAY I/O and Memory Expansion Board (U13), REDLINE RACER Sound Board (U14).

    c.   Check reset on the Z80 (U99-26). This signal should normally be high and go low when the reset button is pressed.

5.   White or red vertical lines close together on entire screen or half of screen.

    a.   Check video RAMs U33 through U36 and U46 through U49. Refer to sheet 11 and 18 on schematic.

6.   Vertical lines on playing field (background).

    a.   Check signals on U81 through U83 (74LS166's).

    b.   Regarding other background problems, check the position of JP2 Jumpers, swap U56, (74LS461) with U60, see if problem disappears.

7.   White vertical bars, usually on half of screen

sometimes with an audio buzz.

      a.   Caused by excessive temperature. Swap U45 with U23 and/or U60 with U22 (74LS461's).

8.   Intermittent flashing video or color changes.

      a.   Check for +5.0 VDC at circuit boards. TP1 and TP2 (+5 VDC)

9.   Picture freezes.

      a.   Check for +5.0 VDC at circuit boards. TP1 and TP2 (+5 VDC)

      b.   Check Z80s (U1 and U99). They should be Zilog Mostek devices with a "B" suffix (6 MHz). If not call for replacement.

      c.   Check for damaged sockets on master EPROMs and master CPU.

10.   Drifting pattern (any color).

      a.   Check connector and signals on P1.

      b.   Sign of synchronization problems. Check DCLK.

      c.   Check U40 (RGS09), U42 (RGS07), and U43 (RGS08).

b.   Buttons, joysticks and coin counters.

    1.   A careful visual inspection of the buttons, harnesses and connectors is advised.

      a.   Inspect harness crimps.

      b.   Check for broken wires.

      c.   Check for broken solder joints at the termination point.

    2.   Trace signals through back to the input IC on the PCB.

2. Electronics

a.   Main board electronics.

    1.   Problems can sometimes be traced to a bad CPU or crystal. Check the master and slave CPU's and their associated components.

    2.   Check EPROMs for background and foreground display and the associated video timing logic.

3.   Check power at the ICs.

b.   Add on board(s) that control game specific functions.

   1.   Again, check for functions specific to the
        board.

   2.   Check all ICs for proper socket installation.

      c.   Check power at the ICs.

3.   General Knowledge

   a.   Proper voltage input jumpering on the board is
        critical! Follow the instructions on this
        carefully. A symptom of improper jumpering is an
        audio buzz or no audio. Check for 12.0 to
        15.0 VDC at U122-5 (audio amp). Refer to Power
        Supply Modification section of manual. NOTE:
        If your speaker is not connected, you will not
        hear any sound! Seriously, try adjusting the
        audio volume control pot (VP1). See section B
        above on adjusting the volume.

   b.   Game powers up with garbage on the screen - no
        buttons function - audio may buzz

      1.   Remove P4 and P5 and reset system (push button
           on main board). If picture appears, the
           problem may be a stuck coin switch, button or
           bad harness or ground connection.

      2.   Visually inspect connector crimps and wire
           colors.

      3.   Check for + 5.0 VDC at board.

   c.   A word about coin counters:

        Do not use mechanical coin counters in any kit or
        dedicated game. These devices produce an inductive
        "kick" that will damage components on the circuit
        board(s). Problems caused by this are checkerboard
        video. A quick check to see if this is your
        problem is look at the "NMI not" signal on both
        Z80s (pin 17). If a low output is observed, try
        replacing U114 (74LS08) or if needed, U119
        (74LS157).

        The bookkeeping on our games is very accurate and
        includes number of coins dropped and dollars
        earned.

        If you must install a coin counter, the next page
        shows a simple hookup using diode protection.

* IF YOU MUST INSTALL A COIN COUNTER

COIN SWITCH

| 1 | 2 | 3 | 4 | 5 |

COIN COUNTER

P4-4
OR
P4-7

+5V

DIODE MAY BE 1N4001 THROUGH 1N4003

DOUBLE PLAY, CONNECTOR PINOUT CHART

```
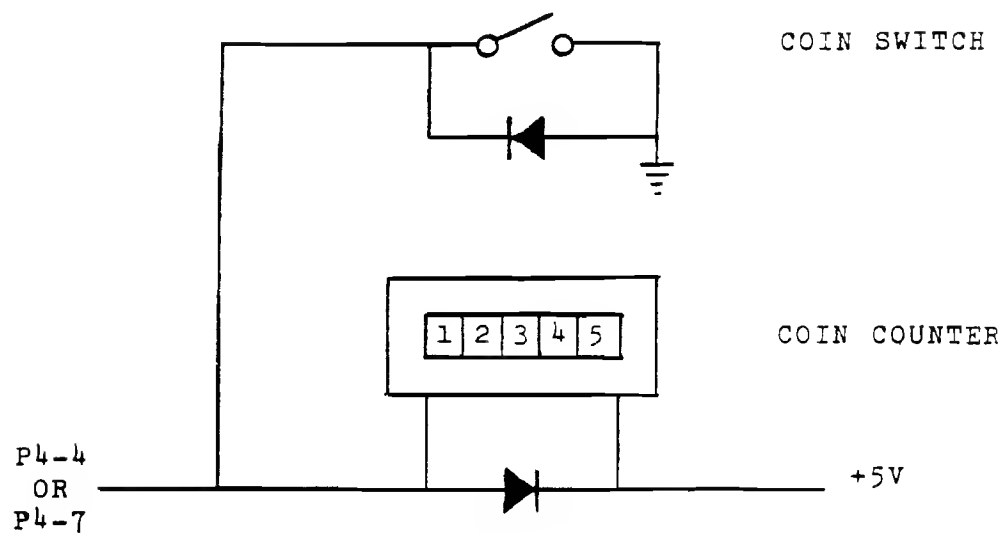FROM                                TO
CONNECTOR   SIGNAL                  CONNECTOR        WIRE
PIN #       DESCRIPTION             PIN #            COLOR
=====================================================================
MAIN LOGIC BOARD CONNECTORS:

P1-1        NOT USED
P1-2        MONITOR,-H SYNC                          GRAY
P1-3        MONITOR,-V SYNC                          WHITE
P1-4        MONITOR,GROUND                           BLACK
P1-5        MONITOR,RED                              RED
P1-6        POLARIZING KEY
P1-7        MONITOR,GREEN                            GREEN
P1-8        NOT USED
P1-9        MONITOR,BLUE                             BLUE
P1-10       NOT USED


P2-1        SPEAKER GROUND          SPEAKER          GRAY
P2-2        SPEAKER GROUND          SPEAKER          WHITE


P3-1        +5 VOLTS                J2-1             RED
P3-2        +5 VOLTS                J2-2             RED
P3-3        +5 VOLTS                J2-3             RED
P3-4        POLARIZING KEY (OPTIONAL) J2-4
P3-5        GROUND                  J2-5             BLACK
P3-6        GROUND                  J2-6             BLACK
P3-7        GROUND                  J2-7             BLACK
P3-8        GROUND                  J2-8             BLACK
P3-9                                J2-9             BROWN
P3-10       +12 OR 25 VOLTS         J2-10            ORANGE


P4-1        NOT USED
P4-2        GND,COIN,SERVICE        COIN DOOR        BLACK OR GREEN
P4-3        TWO PLAYER START        CONTROL PANEL    VIOLET
P4-4        NORMALLY OPEN           COIN SWITCH 2    ORANGE
P4-5        NORMALLY OPEN           SERVICE SWITCH   YELLOW
P4-6        ONE PLAYER START        CONTROL PANEL    WHITE
P4-7        NORMALLY OPEN           COIN SWITCH 1    BLUE
P4-8        NOT USED
P4-9        NOT USED
P4-10       NOT USED


P5-1        NOT USED
P5-2        GROUND                  CONTROL PANEL    GREEN
P5-3        GO BACK (N.O.)          CONTROL PANEL    GRAY
P5-4        RUN/CUTOFF (N.O.)       CONTROL PANEL    BROWN
P5-5        EXTRA BASE (N.O.)       CONTROL PANEL    BLUE
P5-6        RUN/AIM (N.O.)          CONTROL PANEL    YELLOW
P5-7        RUN/STEAL OUTER (N.O.)  CONTROL PANEL    ORANGE
P5-8        NOT USED
P5-9        RUN/STEAL INNER (N.O.)  CONTROL PANEL    RED
P5-10


P6          NOT USED
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
INPUT/OUTPUT AND MEMORY EXPANSION BOARD CONNECTORS:
```

DOUBLE PLAY, CONNECTOR PINOUT CHART

FROM CONNECTOR PIN #	SIGNAL DESCRIPTION	TO CONNECTOR PIN #	WIRE COLOR
J1-1	+5 VOLTS	POWER SUPPLY	RED
J1-2	+5 VOLTS	POWER SUPPLY	RED
J1-3	+5 VOLTS	POWER SUPPLY	RED
J1-4	POLARIZING KEY		
J1-5	GROUND	POWER SUPPLY	BLACK
J1-6	GROUND	POWER SUPPLY	BLACK
J1-7	GROUND	POWER SUPPLY	BLACK
J1-8	GROUND	POWER SUPPLY	BLACK
J1-9	NOT USED		
J1-10	+12 OR +25 VOLTS	POWER SUPPLY	ORANGE
J2-1	+5 VOLTS	P3-1 (MAIN	RED
J2-2	+5 VOLTS	P3-2 LOGIC	RED
J2-3	+5 VOLTS	P3-3 BOARD)	RED
J2-4	POLARIZING KEY	P3-4	
J2-5	GROUND	P3-5	BLACK
J2-6	GROUND	P3-6	BLACK
J2-7	GROUND	P3-7	BLACK
J2-8	GROUND	P3-8	BLACK
J2-9		P3-9	BROWN
J2-10	+12 OR +25 VOLTS	P3-10	ORANGE
J3	NOT USED		
J4-1	GROUND	BATTERS JOYSTICK	GREEN
J4-2	+12 VOLTS	BATTERS JOYSTICK	ORANGE
J4-2	+12 VOLTS	PITCHERS JOYSTICK	ORANGE
J4-3	NOT USED		
J4-4	SWING	BATTERS JOYSTICK	YELLOW
J4-5	UP-DOWN	BATTERS JOYSTICK	BROWN
J4-6	NOT USED		
J4-7	BALL SPEED	PITCHERS JOYSTICK	VIOLET
J4-8	NOT USED		
J4-9	NOT USED		
J4-10	CURVE	PITCHERS JOYSTICK	BLUE
J4-11	POLARIZING KEY		
J4-12	GROUND	PITCHERS JOYSTICK	GREEN
J5-1	GROUND	TAG PCB J1-2	GREEN
J5-2	DATA LINE 13	TAG PCB J1-7	BROWN
J5-3	+5 VOLTS	TAG PCB J1-1	RED
J5-4	CLOCK	TAG PCB J1-5	BLACK
J5-5	RES 3	TAG PCB J1-4	VIOLET
J5-6	RES 2	TAG PCB J1-3	ORANGE
J5-7	DATA LINE 12	TAG PCB J1-6	GRAY
J5-8	DATA LINE 3	TAG PCB J1-10	YELLOW
J5-9	DATA LINE 2	TAG PCB J1-9	BLUE
J5-10	POLARIZING KEY		
J5-11	SPARE	TAG PCB J1-8	WHITE
J5-12	NOT USED		

DOUBLE PLAY, CONNECTOR PINOUT CHART

FROM CONNECTOR PIN #	SIGNAL DESCRIPTION	TO CONNECTOR PIN #	WIRE COLOR
J6	NOT USED		

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

INPUT/OUTPUT AND MEMORY EXPANSION BOARD
40 PIN RIBBON CABLE CONNECTOR:

J7A-1	MASTER ADDRESS LINE 11	U99-1 (MAIN	
J7A-2	MASTER ADDRESS LINE 12	U99-2 LOGIC	
J7A-3	MASTER ADDRESS LINE 13	U99-3 BOARD)	
J7A-4	MASTER ADDRESS LINE 14	U99-4	
J7A-5	MASTER ADDRESS LINE 15	U99-5	
J7A-6	CLOCK	U99-6	
J7A-7	MASTER DATA LINE 4	U99-7	
J7A-8	MASTER DATA LINE 3	U99-8	
J7A-9	MASTER DATA LINE 5	U99-9	
J7A-10	MASTER DATA LINE 6	U99-10	
J7A-11	+5 VOLTS	U99-11	
J7A-12	MASTER DATA LINE 2	U99-12	
J7A-13	MASTER DATA LINE 7	U99-13	
J7A-14	MASTER DATA LINE 0	U99-14	
J7A-15	MASTER DATA LINE 1	U99-15	
J7A-16	INT	U99-16	
J7A-17	MNMI	U99-17	
J7A-18	NOT USED	U99-18	
J7A-19	MREQ	U99-19	
J7A-20	I/O REQ	U99-20	
J7A-21	RD	U99-21	
J7A-22	WR	U99-22	
J7A-23	NOT USED	U99-23	
J7A-24	WAIT	U99-24	
J7A-25	+5 VOLTS	U99-25	
J7A-26	POR	U99-26	
J7A-27	M1	U99-27	
J7A-28	RFSH	U99-28	
J7A-29	GROUND	U99-29	
J7A-30	MASTER ADDRESS LINE 0	U99-30	
J7A-31	MASTER ADDRESS LINE 1	U99-31	
J7A-32	MASTER ADDRESS LINE 2	U99-32	
J7A-33	MASTER ADDRESS LINE 3	U99-33	
J7A-34	MASTER ADDRESS LINE 4	U99-34	
J7A-35	MASTER ADDRESS LINE 5	U99-35	
J7A-36	MASTER ADDRESS LINE 6	U99-36	
J7A-37	MASTER ADDRESS LINE 7	U99-37	
J7A-38	MASTER ADDRESS LINE 8	U99-38	
J7A-39	MASTER ADDRESS LINE 9	U99-39	
J7A-40	MASTER ADDRESS LINE 10	U99-40	
J7B	NOT USED		